



# Sperm donor anonymity and compensation: an experiment with American sperm donors

Glenn Cohen<sup>1,\*</sup>, Travis Coan<sup>2</sup>, Michelle Ottey<sup>3</sup>  
and Christina Boyd<sup>4</sup>

1. Harvard Law School, Cambridge, MA 02138, USA

2. Department of Politics, University of Exeter, Exeter, Devon EX4 4RJ, UK

3. Fairfax Cryobank Inc, Fairfax, VA 19104, USA

4. Fertility Center of San Antonio, San Antonio, TX 78229, USA

\* Corresponding author. E-mail: [igcohen@law.harvard.edu](mailto:igcohen@law.harvard.edu)

## ABSTRACT

Most sperm donation that occurs in the USA proceeds through anonymous donation. While some clinics make the identity of the sperm donor available to a donor-conceived child at age 18 as part of ‘open identification’ or ‘identity release programs,’ no US law requires clinics to do so, and the majority of individuals do not use these programs. By contrast, in many parts of the world, there have been significant legislative initiatives requiring that sperm donor identities be made available to children after a certain age (typically when the child turns 18). One major concern with prohibiting anonymous sperm donation has been that the number of willing sperm donors will decrease leading to shortages, as have been experienced in some of the countries that have prohibited sperm donor anonymity. One possible solution, suggested by prior work, would be to pay current anonymous sperm donors more per donation to continue to donate when their anonymity is removed. Using a unique sample of current anonymous and open identity sperm donors from a large sperm bank in the USA, we test that approach. As far as we know, this is the first attempt to examine what would happen if the USA adopted a prohibition on anonymous sperm donation that used the most ecologically valid population, current sperm donors. We find that 29% of current anonymous sperm donors in the sample would refuse to donate if the law changed such that they were required to put their names in a registry available to donor-conceived children at age 18. When we look at the remaining sperm donors who would be willing to participate, we find that

they would demand an additional \$60 per donation (using our preferred specification). We also discuss the ramifications for the industry.

**KEYWORDS:** Reproductive technologies, sperm donation, anonymity, donor-conceived, sperm banking, egg banking

## I. INTRODUCTION

Across the world, countries have reached radically different positions on whether to allow anonymous sperm donation.

In the USA, most sperm donation that occurs proceeds through anonymous donation.<sup>1</sup> While some clinics make the identity of the sperm donor available to a donor-conceived child at age 18 as part of ‘open identification’ or ‘identity release programs’,<sup>2</sup> no US law requires clinics to do so, and the majority of individuals do not use these programs.

By contrast, in many parts of the world, there have been significant legislative initiatives requiring that sperm donor identities be made available to children after a certain age (typically when the child turns 18). In 1985, Sweden became the first country to prohibit anonymous sperm donation by requiring that donor-conceived children be able to receive identifying information about their sperm donor when ‘sufficiently mature’.<sup>3</sup> The Swedish effort was followed by a number of jurisdictions including Austria, Germany, Switzerland, the Australian States of Victoria and Western Australia, the Netherlands, Norway, the United Kingdom, and New Zealand.<sup>4</sup>

There is a push by many for the USA to adopt a similar system to enable donor-conceived children to have access to information on their donors.

As we discuss in much greater depth below, one major concern with prohibiting anonymous sperm donation has been that the number of willing sperm donors will decrease leading to shortages, as have been experienced in some of the countries that have prohibited sperm donor anonymity.

One possible solution, suggested by prior work, would be to pay current anonymous sperm donors more per donation to continue to donate when their anonymity is removed.<sup>5</sup>

Using a unique sample of current anonymous and open identity sperm donors from a large sperm bank in the USA, we test that approach. As far as we know, this is the first

<sup>1</sup> See eg Mary Kate Kearney, *Identifying Sperm and Egg Donors: Opening Pandora's Box*, 13 J.L. & FAM. STUD. 215, 225 (2011); Julie L. Sauer, Comment, *Competing Interests and Gamete Donation: The Case for Anonymity*, 39 SETON HALL L. REV. 919–22 (2009).

<sup>2</sup> Naomi Cahn, *The New Kinship*, 100 GEO. L.J. 367, 382–83 (2012).

<sup>3</sup> Claes Gottlieb, Othon Lalos & Frank Lindblad, *Disclosure of Donor Insemination to the Child: The Impact of Swedish Legislation on Couples' Attitudes*, 15 HUM. REPROD. 2052, 2052 (2000).

<sup>4</sup> Michelle Dennison, *Revealing Your Sources: The Case for Non-Anonymous Gamete Donation*, 21 J.L. & HEALTH 1, 8–9 (2008); Ilke Turkmendag, Robert Dingwall & Thérèse Murphy, *The Removal of Donor Anonymity in the UK: The Silencing of Claims By Would-Be Parents*, 22 INT'L J. L. POL'Y & FAM. 283, 283–84 (2008); Ken Daniels & Alison Douglass, *Access to Genetic Information by Donor Offspring and Donors: Medicine, Policy and Law in New Zealand*, 27 MED. & L. 131–37; Christopher De Jonge & Christopher L.R. Barratt, *Gamete Donation: A Question of Anonymity*, 85 FERTIL. & STERIL. 500, 500 (2006).

<sup>5</sup> I. Glenn Cohen & Travis G. Coan, *Can You Buy Sperm Donor Identification? An Experiment*, 10 J. EMPIRICAL LEGAL STUD. 715–34 (2013).

attempt to examine what would happen if the USA adopted a prohibition on anonymous sperm donation that used the most ecologically valid population, current sperm donors. We find that 29 per cent of current anonymous sperm donors in the sample would refuse to donate if the law changed such that they were required to put their names in a registry available to donor-conceived children at age 18. When we look at the remaining sperm donors who would be willing to participate, we find that they would demand an additional \$60 per donation to participate (using our preferred specification that drops protest bid outliers, and \$127 more per donation if we include those outliers).

This article proceeds as follows. Section II explains how countries that have prohibited sperm donor anonymity have operated, provides background on the ongoing bioethical debate on sperm donor anonymity, and describes the prior empirical work on whether sperm donor shortages result when anonymity is prohibited and whether compensation can solve the problem. Section III describes the methods for our study. Section IV provides the results. Section V discusses the implications for policy. Section VI briefly concludes.

## II. BACKGROUND

### A. The alternative to anonymity: the UK model as an example

Before discussing the policy debate and prior empirical work on the subject, it is helpful to better understand the alternative. Most countries that have prohibited sperm donor anonymity have done so by legally requiring all sperm donors to put identifying information into a 'registry' available to the donor-conceived children at age 18.

The United Kingdom gives a good example about how these systems currently operate.

The Human Fertilisation and Embryology Authority (HFEA)'s website announces to prospective egg or sperm donors:

Those who donated sperm, eggs or embryos after 1 April 2005 are, by law, identifiable. Any person born as a result of donation after this time is entitled to request and receive their donor's name and last known address, once they reach the age of 18.

Donors who donated before 1 April 2005 are automatically anonymous. This means that donor-conceived people can only access non-identifying information provided by the donor at the time of donation.

As a donor, you have no legal rights to contact your donor-conceived offspring; the decision to initiate contact is solely that of the donor-conceived child.

...

It is a right of those who donated before 1 April 2005 to choose to remove their anonymity – and potentially become identifiable to any children born from their donation.

As a consequence of removing your anonymity, your donor-conceived offspring may choose to make contact with you once they reach the age of 18. The HFEA will try to contact you first using the details held on file to let you know that a request for your contact details has been made. Before making this decision, you may wish to consider how this could impact on you and your family. If you wish, you can ask to speak to a counsellor at the clinic you donated at to talk through the implications of re-registering as an identifiable donor.

Bear in mind that you may not be contacted by any donor-conceived offspring. This could be for a number of reasons, including the possibility that they do not know they are donor-conceived.

If you donate through an HFEA-licensed clinic, you will not be legally responsible for any child born as result of your donation.<sup>6</sup>

In terms of the information requested and available, the HFEA distinguishes between identifying and non-identifying information it makes available to donor offspring at different ages:

From 1 April 2005 this is the information the HFEA collected from you at the time of donation:

- your physical description (height, weight, eye and hair colour)
- the year and country of your birth
- your ethnicity
- whether you had any children at the time of donation, how many and their gender
- your marital status
- your medical history
- a goodwill message to any potential children
- identifying information (your name, date of birth and last known address).

Donor-conceived people conceived after 1 April 2005, when they reach 16 years old, are able to apply to the HFEA to receive the non-identifying information that their donor provided (all information given by the donor except for their name and last-known address).

Donor-conceived people conceived after 1 April 2005, when they reach 18 years old are able to apply to the HFEA to find the information their donor provided, including identifying information.<sup>7</sup>

## B. The policy debate

Movements to legally prohibit sperm donor anonymity have succeeded in many European countries and Australia, whereas sperm donor anonymity remains legal (and indeed the norm) in the USA. In Canada, litigation to prohibit sperm donor anonymity initially succeeded, only to be reversed at a higher court level.<sup>8</sup>

Underlying these legislative and judicial decisions is a vociferous bioethical debate on the merits of prohibiting anonymous sperm donation. This debate has had several dimensions.

Some opponents of anonymous sperm donation have urged that it be ended in order to fulfill a donor-conceived child's right to know his or her medical history.<sup>9</sup> The other side counters that such medical history can be transmitted and documented *without*

<sup>6</sup> Human Fertilisation & Embryology Authority, *Re-Register as an identifiable donor*, <http://www.hfea.gov.uk/1973.html> (accessed Aug. 6, 2016).

<sup>7</sup> Human Fertilisation & Embryology Authority, *Conceived on or After 1 April 2005*, <http://www.hfea.gov.uk/5554.html> (accessed Aug. 6, 2016).

<sup>8</sup> See *Pratten v. British Columbia (Attorney General)*, (2012) BCCA 480 (Can.).

<sup>9</sup> See eg Rebecca Johns, *Abolishing Anonymity: A Rights-Based Approach to Evaluating Anonymous Sperm Donations*, 20 UCLA WOMEN'S L. J. 111, 117–18 (2013); Vadit Ravitsky, *Knowing Where You Come From: The Rights of Donor-Conceived Individuals and the Meaning of Genetic Relatedness*, 11 MINN. J. L. SCI. & TECH. 655–71 (2010).

sharing the donor's identity, especially in our current era of low-cost whole genome sequencing.<sup>10</sup>

Some argue that removing anonymity actually furthers the interest of intended parents who are employing sperm donors, because they may later change their minds and want their donor-conceived child to connect with the child's genetic father.<sup>11</sup> The other side disputes that such changes of preference are likely and stresses that a system that does not prohibit anonymity better enables parents to satisfy a preference for contact through the availability of open identity banks, and that such a solution is better than a one-size-fits all approach.<sup>12</sup>

The most prominent argument for prohibiting anonymity has been that donor-conceived children are harmed when they do not have access to the identities of their genetic fathers, sometimes framed in the language of rights as a 'right to know one's genetic origin'.<sup>13</sup> Critics have responded that, among other things, this argument rests on a philosophically unsound conception of harm—because changing the system will change which or how many children come into existence instead of harming an existing person.<sup>14</sup> They have also argued that the same right, if it exists, should apply to children born through coitus rather than reproductive technologies. This suggests that the state would be justified in establishing a 'one night stand registry', or mandating genetic testing for paternity to avoid the widespread phenomenon of misattributed paternity through coital sex, which seems a *reductio ad absurdum* of the argument.<sup>15</sup>

Finally, and most pertinent to our purposes, there has been significant debate as to whether banning sperm donor anonymity leads to significant reductions in the number of men willing to be sperm donors and whether this effect is only short term or long lasting.<sup>16</sup>

### C. The problem (?) of sperm donor shortage

There is a rich, though contested, literature on the effects of prohibiting sperm donor anonymity on the availability of sperm donors.

In general, countries that have prohibited sperm donor anonymity have seen (at least) a short-term diminution in the pool of willing sperm donors. In 2010,

<sup>10</sup> I. Glenn Cohen, *Sperm and Egg Donor Anonymity*, in *THE OXFORD HANDBOOK OF REPRODUCTIVE ETHICS* (Leslie Francis ed., 2016).

<sup>11</sup> Cahn, *supra* note 2, at 425.

<sup>12</sup> I. Glenn Cohen, *Response: Rethinking Sperm-Donor Anonymity: Of Changed Selves, Nonidentity, and One-Night Stands*, 100 *GEO. L. J.* 431–33 (2012).

<sup>13</sup> DEP'T HEALTH & SOCIAL SECURITY, REPORT OF THE COMMITTEE OF INQUIRY INTO HUMAN FERTILISATION AND EMBRYOLOGY, 1984, Cm. 9314, at 24–25 (UK); Ellen Goodman, *Kids' Right to Know Trumps Sperm Donors' Right to Anonymity*, *THE BALTIMORE SUN*, Dec. 22, 2006, [http://articles.baltimoresun.com/2006-12-22/news/0612220130\\_1\\_sperm-donors-sperm-bank-pregnancy](http://articles.baltimoresun.com/2006-12-22/news/0612220130_1_sperm-donors-sperm-bank-pregnancy) (accessed Oct. 12, 2016); Elizabeth S. Chestney, *The Right to Know One's Genetic Origin: Can, Should, or Must a State that Extends This Right to Adoptees Extend an Analogous Right to Children Conceived with Donor Gametes?*, 80 *TEX. L. REV.* 365, 365 (2001); Ravitsky, *supra* note 9, at 665.

<sup>14</sup> Cohen, *supra* note 12, at 435.

<sup>15</sup> Cohen, *supra* note 12, at 443; An Ravelingien & Guido Pennings, *The Right to Know Your Genetic Parents: From Open-Identity Gamete Donation to Routine Paternity Testing*, 13 *AM. J. BIOETHICS* 33–35 (2013).

<sup>16</sup> See eg Cahn, *supra* note 2, at 419–21; Gaia Bernstein, *Regulating Reproductive Technologies: Timing, Uncertainty, and Donor Anonymity*, 90 *B.U. L. REV.* 1189, 1209–10 n.117 (2010); Helen Szoke, *The Victorian Experience of Administering Donor Birth Registers*, 1271 *INT'L CONGRESS SERIES* 357–58 (2004).

Gaia Bernstein devoted a significant portion of a law review article to determining the effects on supply in various markets.<sup>17</sup> A summary of her findings<sup>18</sup> is as follows:

Sweden adopted sperm donor identification in 1985 and witnessed the number of children born through sperm donation as the number of donor sperm decline from 200 new donors per year just before the law came into effect to 30 new donors per year by 1988. Reports also indicated that half the hospitals that offered artificial insemination by donor closed their programs, both of which commentators attributed to the change in the law.<sup>19</sup> However, a 1995 study based on data accumulated between 1989 and 1993 indicated a 65 per cent increase in the number of donors, from 69 new donors in 1989 to 106 in 1993, which some commentators took as evidence that the prohibition on sperm donor anonymity only caused an *initial* decline in the number of donors that was later overcome by recruitment measures.<sup>20</sup> Bernstein, however, disputes that reading of the data, noting that no study has looked at the post-1995 data, which are largely unavailable.<sup>21</sup> She suggests there is good reason to suspect that dwindling donor participation remains a problem in Sweden, pointing to a study showing a steady decline from 900 yearly inseminations in 1985 to 300 yearly inseminations in 2005 as well as shortages causing long wait lists of 6 to 18 months for access to insemination. She further suggests that earlier reports of a 'rebound' may have been distorted and instead reflected the fact that 'demand may have been lower in Sweden than in other countries like the USA because, until 2005, lesbians were not allowed to use donor sperm'.<sup>22</sup> Sweden's rules about compensation have apparently changed over time: Sweden permits compensation to sperm and egg donors, but since 2006 it has 'begun prohibiting trading in eggs and sperm for profit', even though 'gamete owners who donate their gametes are still compensated'.<sup>23</sup>

The Australian state of Victoria enacted laws pertaining to sperm donor identification in two stages. First, in 1984, Victoria created a mandatory donor registry that went into effect in 1988, but under this law no information could be released without the contemporaneous consent of the donor. Then, in 1995 the legislature passed a new law that went into effect in 1998 that allowed donor-conceived children to access information about donors once they reach the age of 18.<sup>24</sup> Reviewing the data, Bernstein concludes that they show a 'consistent decline in the numbers of newly registered sperm donors' that is coincident in time with the passage of each of the laws.<sup>25</sup> The scarcity of sperm

<sup>17</sup> Bernstein, *supra* note 16, at 1207–13.

<sup>18</sup> Also drawing on a review from Cohen and Coan, *supra* note 5, at 718–19 and Cohen, *supra* note 10.

<sup>19</sup> Bernstein, *supra* note 16, at 1207–08; M. Bygedemen, *The Swedish Insemination Act*, 70 ACTA OBSTET. GYNECOL. SCAND. 265–66 (1991); Ken Daniels & Othon Lalos, *The Swedish Insemination Act and the Availability of Donors*, 10 HUM. REPROD. 1871, 1871–72 (1995).

<sup>20</sup> Bernstein, *supra* note 16, at 1208; Daniels and Lalos, *supra* note 19, at 1872–73.

<sup>21</sup> Bernstein, *supra* note 16, at 1208.

<sup>22</sup> Bernstein, *supra* note 16, at 1208–09; Erling Ekerhovd, Anders Faurskov & Charlotte Werner, *Swedish Sperm Donors Are Driven by Altruism, But Shortages of Sperm Donors Leads to Reproductive Travelling*, 113 UPSALA J. MED. SCI. 305, 311–12 (2008).

<sup>23</sup> Bernstein, *supra* note 16, at 1209; Lag om genetisk integritet (Svensk författningssamling [SFS] 2006:351) (Swed.).

<sup>24</sup> *Infertility (Medical Procedures) Act 1984* (Vic) (Austl.); Bernstein, *supra* note 16, at 1209.

<sup>25</sup> Bernstein, *supra* note 16, at 1209–10 n.117 (citations omitted).



donors has been further exacerbated by a 2006 law prohibiting compensation for sperm donation beyond reasonable expenses.<sup>26</sup>

Data from the United Kingdom on the effects of sperm donor anonymity are more difficult to interpret. By regulations that went into effect in 2006, all UK sperm donors were required to put identifying information in a registry available to donor-conceived children when they turn 18.<sup>27</sup> Although the number of newly registered sperm donors has not declined from before the law changed, some contend that this statistic is not particularly probative because there has been an increase in known donors—friends or relatives who donate for one person’s exclusive use—such that the amount of sperm from unrelated donors available to most infertile patients for use has significantly declined.<sup>28</sup> Bernstein also finds evidence supporting a decline in the availability of sperm for reproductive use from the fact that ‘IVF treatment cycles with donated sperm steadily decreased from 939 in 2004 to 711 in 2007 and insemination treatment cycles with donor sperm decreased from 6892 in 2004 to 3878 in 2007’.<sup>29</sup> However, data from 2009 to 2010 released after her study suggest that these numbers ‘rebounded’ to where they were before the law change, although not for insemination.<sup>30</sup> As Bernstein documents, reports from the actual British clinics in the years immediately after the passage of the Act also suggested significant shortages and longer wait times for those seeking to use donated sperm.<sup>31</sup>

<sup>26</sup> *Prohibition of Human Cloning for Reproduction and the Regulation of Human Embryo Research Amendment Act 2006* (Austl.); Bernstein, *supra* note 16, at 1211.

<sup>27</sup> The Human Fertilisation and Embryology Authority (Disclosure of Donor Information) Regulations 2004, SI 2004/1511 (Eng.).

<sup>28</sup> Human Fertilisation & Embryology Authority, *New donor Registrations*, <http://www.hfea.gov.uk/3411.html> (accessed Aug. 6, 2016); Bernstein, *supra* note 16, at 1211–12; Rebecca Camber, *Britain Faces Fertility Crisis as Loss of Donor Anonymity Sees Sperm and Egg Donor Numbers Plummet*, MAIL ONLINE (June 26 2008), <http://www.dailymail.co.uk/health/article-1029712/Britain-faces-fertility-crisis-lossdonor-anonymity-sees-sperm-egg-donor-numbers-plummet.htm> (accessed Oct. 12, 2016). For a lengthier discussion of how to interpret the UK data, see Cahn, *supra* note 2. Cahn suggests that in the UK, ‘[t]he real problem may not be a decline in the number of donors or donations, but rather an inefficient system of treating women with donor sperm, which can be corrected by improved record-keeping and communication[.]’ NAOMI CAHN, *THE NEW KINSHIP: CONSTRUCTING DONOR-CONCEIVED FAMILIES* 169 (2013).

<sup>29</sup> Bernstein, *supra* note 16, at 1212.

<sup>30</sup> Human Fertilisation & Embryology Authority, *Donor Conceptions—Patients and Treatments*, <http://www.hfea.gov.uk/donor-conception-treatments.html> (accessed Aug. 6, 2016).

<sup>31</sup> Bernstein, *supra* note 16, at 1212. Bernstein cites several sources to claim that most clinics have a wait of at least two years for donor sperm, see Camber, *supra* note 28; that a BBC survey of 78 of the 85 UK fertility clinics indicated over six-month wait times for clients, see Jane Dreaper, *IVF Donor Sperm Shortage Revealed*, BBC NEWS, Sept. 13, 2006, <http://news.bbc.co.uk/2/hi/health/5341982.stm> (accessed Oct. 12, 2016); that some clinics had long waits and stopped offering donor sperm, see Denise Grady, *Shortage of Sperm Donors in Britain Prompts Calls for Change*, NEW YORK TIMES, Nov. 12, 2008, [http://www.nytimes.com/2008/11/12/health/12sperm.html?\\_r=0](http://www.nytimes.com/2008/11/12/health/12sperm.html?_r=0) (accessed Oct. 12, 2016); and that other issues exist, see U.K. *Facing Sperm Donor Shortage: Experts Say Scarcity Prompted by Reversing Confidentiality Laws*, ASSOCIATED PRESS, Nov. 13, 2008, <http://www.cbsnews.com/stories/2008/11/13/health/main4597958.shtml> (accessed Oct. 12, 2016). There are also more anecdotal data. For example, Kim Mutcherson reports that when Canada ‘made it illegal to pay men for their sperm or women for ova in a 2004 law called the Assisted Human Reproduction Act . . . the number of men in the country willing to sell their sperm dropped precipitously’. *Welcome to the Wild West: Protecting Access to Cross Border Fertility Care in the United States*, 22 CORNELL J. L. & PUB. POL’Y. 349, 364 n.68. In short order, all of the agencies that formerly sold sperm closed their doors save for one. One 2010 newspaper article reported that there were only 40 sperm sellers available in all of Canada. *Anonymous Sperm Donation Needed Fertility Experts*, CANADIAN PRESS, Oct. 27, 2010,

Bernstein's read of the data is not shared by all academics working in this area. Naomi Cahn, for example, has written that while

requiring the release of information may have some initial impact on the number of donors, predictions of drastic long-term effects appear overblown. Moreover, such legislation may result in the development of new methods to recruit other donors ... By changing advertising techniques to emphasize helping others rather than the amount of payment, sperm and egg banks may be able to recruit donors who care less about money and more about facilitating the creation of families.... But payment, rather than anonymity, does seem to remain a critical component; when Canada outlawed payment for sperm donors, the sperm supply decreased dramatically.<sup>32</sup>

Observational studies such as these are useful, but they can only incompletely inform our understanding of the policy choice that governments face. First, like most observational designs, these studies have difficulty separating coincidence from causation, especially since none of these studies has a comparison state that can be used to evaluate the results. In particular, one might worry about preexisting secular time trends in donor participation in the countries that adopted donor identification laws and also the possibility of reverse causation in that adoption of these laws may be driven by these trends in donation and not vice versa. There may also be omitted variables that affect both the rate of donation and the propensity to pass legislation, such as anti-commercialization forces. Second, as Bernstein has noted, during the relevant periods of these observational studies, changes in infertility technology and practices—for example, the introduction of more effective procedures such as IVF and intracytoplasmic sperm injection—make it more difficult to determine whether the data show changes in the supply side alone or also changes in the demand side, which could have reduced the need for sperm donors.<sup>33</sup>

Further, because most of these countries also have in place strict prohibitions on sperm donor compensation (Sweden being a partial exception), these observational studies are not optimally designed to investigate whether one can 'buy' sperm donor non-anonymity through increasing payment to donors.<sup>34</sup>

---

<http://www.ctvnews.ca/anonymous-sperm-donation-needed-fertility-experts-1.567670> (accessed Oct. 12, 2016). It is also worth noting two reasons why this data may not offer a complete picture. The first is the possibility that there may exist some 'underground' exchange of sperm or egg that tries to circumvent the non-anonymity rules, for example, through at-home insemination. Second, to anticipate a point we return to at the end of this chapter, medical tourism for reproductive technologies ('fertility tourism' as other experts have called it elsewhere, see I. GLENN COHEN, *PATIENTS WITH PASSPORTS: MEDICAL TOURISM, LAW, AND ETHICS* (Ch 9 (2014))) may provide parents a way of circumventing these rules through travel. We do not have that much data on the role that anonymity plays in fertility tourism, but here is one pertinent study: In a 2010 study by the European Society of Human Reproduction and Embryology of female patients seeking reproductive technology services through medical tourism at 46 clinics in six popular European destination countries for fertility tourism, Shenfield and colleagues reported that 18.9 per cent of Swedish and 16.4 per cent of Norwegian patients stated that they traveled to get anonymous sperm donation unavailable at home. *Id. discussing* Francoise Shenfield et al., *Cross Border Reproductive Care in Six European Countries*, 25 HUM. REPROD. 1361–63 (2010).

<sup>32</sup> Cahn, *supra* note 2, at 421.

<sup>33</sup> Bernstein, *supra* note 16, at 1210.

<sup>34</sup> Cohen and Coan, *supra* note 5, at 720.



#### D. Prior experimental work

To our knowledge, Cohen and Coan (2013) was the first study to evaluate the influence of mandatory identification laws on individual preferences for sperm donation using an experimental design. The study relied on a convenience sample of 393 males between the ages of 18 and 60 who lived in the USA at the time. Subjects were randomly assigned into one of two groups: a control group in which respondents received information on donor confidentiality consistent with current US law (ie identifying information is protected by anonymity) or a treatment group that received information on confidentiality consistent with current UK law (ie identifying information *is not* protected in that there is a mandatory registration requirement). The authors find that subjects in the donor-identified condition needed to be paid significantly more, on average, to donate their sperm than those in the anonymous sperm donor conditions. When examining the full sample of subjects ( $N = 393$ ), subjects receiving information on mandatory identification needed to be paid roughly \$40 more than subjects in the control condition, while subjects who would actually consider donating sperm ( $n = 332$ ) require an additional \$31 on average. In both cases, the loss of anonymity is associated with a considerable extra estimated cost, although in absolute terms the cost of sperm is still relatively 'cheap' (compared, for example, to eggs donation which typically demand \$5000 to \$10 000 dollars<sup>35</sup>) even with these increased costs.

This price differential found in these studies corresponds roughly to that of the one set of published data we have on differential pricing in the USA (based on what donors are paid) for a US sperm bank that operates both anonymous and identity release programs. Gametes, Inc., a major US sperm bank, operates both anonymous and identity release programs: in 2006, the bank paid \$65 to anonymous sperm donors per donation and \$100 to those who donated as part of the identity release program.<sup>36</sup>

While the Cohen and Coan findings were suggestive, one major limitation has to do with ecological validity. The men recruited for the study were *not* sperm donors. Would sperm donors react the same way? As Cohen and Coan put it:

Sperm banks are notoriously selective in who they permit to donate, including screening many individuals based on family medical history and how well their sperm freezes. Indeed, upwards of 90 per cent of individuals who make initial contact with a sperm bank in the U.S. are not chosen to become sperm donors. We have no idea how many members of our sample would meet these sperm banks' criteria, and thus how representative our sample is as to actual U.S. sperm donors rather than potential sperm donors. That said, this particular limitation does not seem overly troubling for two reasons. First, we have no reason to suspect interactions between the kinds of things that would screen an individual out from being a sperm donor and their responsiveness to the treatment vs. control condition. Second, most of the criteria sperm banks currently use for screening are not fixed, and sperm banks might change their criteria if they faced changes in the number of willing donors. This has been a strategy used by many foreign countries in the wake of changing their policy on anonymity.<sup>37</sup>

<sup>35</sup> See *eg* Kamakahi v. Am. Socy. for Reproductive Medicine, 305 F.R.D. 164, 171 (N.D. Cal. 2015); Ashby Jones, *Putting a Price on a Human Egg*, WALL STREET JOURNAL, July. 26, 2015, <http://www.wsj.com/articles/putting-a-price-on-a-human-egg-1437952456> (accessed Oct. 12, 2016).

<sup>36</sup> RENE ALMELING, SEX CELLS: THE MEDICAL MARKET FOR EGGS AND SPERM 121 (2011).

<sup>37</sup> Cohen and Coan, *supra* note 5, at 735 citing ALMELING, *supra* note 36, at 59.

In order to overcome this limitation of our prior work, this paper represents the first attempt to examine the same questions using *actual* anonymous sperm donors.

### III. METHODS

#### A. Participants and procedures

We conducted an experiment to assess the effect of a change in donor identification rules on the willingness of subjects to donate and the price required to ensure continued donation. The study was administered from June 15, 2013 to August 15, 2013 using a sample of active and inactive donors from a large cryobank in the USA. The bank had multiple locations and employs recruitment efforts similar to other large US banks. A staff member at the bank sent an invitation to participate in ‘a unique opportunity’ to participate in a research study and offered a 15\$ Amazon gift card ‘as a thank you for ... participat[ing]’. In addition to the initial request for participation, the bank sent two reminder emails (roughly 5 days apart) and a final email indicating that it was their ‘last chance to participate’ the day prior to closing the study. In the end, we sent the questionnaire to 67 active donors and 204 inactive donors; of these individuals, all 67 active responded to the questionnaire, while 94 inactive donors responded (response rate = 46 per cent). Of the 161 respondents in our sample, 90 are (or were) anonymous donors and 71 are (or were) ID donors.

#### B. Experimental design and procedures

Our experimental design employed follows closely the prior work of Cohen and Coan.<sup>38</sup> After reading a one-page information sheet and consenting to be part of the research study, participants were randomly assigned to either a *treatment* or *control* condition. Subjects in the *treatment* condition were asked to carefully read the following information on the UK system prior to answering the questionnaire:

Many developed nations require sperm donors to be identified, typically requiring new sperm donors to put identifying information into a registry that is made available to a donor-conceived child once they reach the age of 18. Recently, advocates have pressed U.S. states to adopt these registries as well, and some state legislatures have considered adopting such systems. In this study, we are interested in your reaction to one particular proposed model of sperm donor identification system (we will call this “the sperm donor identification system” in our questions) based on the U.K. system. In this system, by law, any person born as a result of your donation, once he/she reaches the age of 18, is entitled to request and receive (from a government-run agency) the following information:

- Identifying information (your name, date of birth and last known address)
- Your physical description (height, weight, eye and hair color) at the time of donation
- The country of your birth
- Your ethnicity
- Whether you had any children at the time of donation, how many, and their gender
- Your marital status at the time of donation
- Your medical history at the time of donation
- A message (which you may choose to write) to any potential children.

---

<sup>38</sup> Cohen and Coan, *supra* note 5, at 721–31.

The donor would have no legal rights to contact the offspring; the decision to initiate contact is solely that of the donor-conceived child. Donors are protected from any kind of parental responsibility by state and federal law.

The treatment was designed to communicate efficiently the most salient features of UK donor laws and thus provide a realistic opportunity for donors to assess the costs associated with a change in the law. Following Cohen and Coan, we attempt to mitigate possible order effects associated with the informational bullets by (i) fixing the position of the first bullet on 'identifying information' and (ii) randomizing the order of the remaining bullets. After reading the text on mandatory identification rules, subjects in the *treatment* condition were asked to provide the amount of money needed to donate and given the option to not donate 'at any price' (see Section III.C for additional details).

Subjects in the *control* condition did not receive any information on mandatory identification rules. After agreeing to participate in the study, these subjects were once again asked to provide the amount of money needed to donate and given the option to not donate 'at any price'. That is, the only difference between the *treatment* and *control* conditions was the provision of information on UK identification rules.

### C. Measuring the 'willingness-to-accept' for donation

There is a well-developed literature on the methodological challenges associated with providing valid and reliable measures of a subject's 'willingness-to-pay' (WTP) or 'willingness-to-accept' (WTA) for the provision of a particular good or service.<sup>39</sup> Developed primarily in the field of natural resource economics, 'contingent valuation' (CV) methods offer a set of tools for addressing policy questions associated with public goods and market failures, and thus have garnered considerable attention in the literature.<sup>40</sup> As a result, there is now well-developed literature outlining the best practices for employing CV methods to meet diverse policy goals.<sup>41</sup>

The obvious question when employing CV methods centers on how one should go about eliciting a value for WTP or WTA. There is no shortage of different elicitation formats in the literature, ranging from simple open-ended questions to more complicated dichotomous choice designs.<sup>42</sup> In the present study, we employed open-ended questions to elicit a subject's WTA. Specifically, subjects in the *treatment* condition received the following question:

'If U.S. law was changed in this way, how much money, if any, would you need to be paid in order to donate your sperm?'

We employ the open-ended CV format for both practical and methodological reasons. First, dichotomous choice methods require considerable sample sizes to ensure

<sup>39</sup> ROBERT MITCHELL & RICHARD CARSON, USING SURVEYS TO VALUE PUBLIC GOODS: THE CONTINGENT VALUATION METHOD (1989); TIMOTHY C. HAAB & KENNETH MCCONNELL, VALUING ENVIRONMENTAL AND NATURAL RESOURCES (2002).

<sup>40</sup> See generally John K. Horowitz & Kenneth E. McConnell, *A Review of WTA/WTP Studies*, 44 J. ENVTL. ECON. & MGMT. 426 (2002).

<sup>41</sup> Report of the NOAA Panel on Contingent Valuation, 58 Fed. Reg. 4601 (Jan. 15, 1993).

<sup>42</sup> For an overview, see Cohen and Coan, *supra* note 5 and the citations therein.

efficient estimation,<sup>43</sup> which are infeasible to meet given the overall size of the available donor pool in the USA, and certainly at any one sperm bank. In contrast, the open-ended format offers a highly efficient use of information. Second, dichotomous choice models are appropriate—and often necessary—when subjects have limited information on the valuation decision. For instance, asking an individual to place a price on a national park is likely to be challenging, as few people have given this valuation decision much thought and thus may feel as if they are ‘picking a value out of thin air’. Cohen and Coan make a similar argument when using a convenience sample of males in the USA, most of which have never donated sperm in the past. However, given that the present study focuses on actual donors, ‘[the open-ended format] is likely to work quite well for the population of current sperm donors...as these individuals have first-hand experience with the sperm donation process and have been compensated for donating in the past’.<sup>44</sup>

#### D. Representativeness of the inactive donor sample

While the active donors were highly responsive to our questionnaire, inactive donors registered a response rate of 46 per cent. Although survey non-response does not necessarily imply non-response bias,<sup>45</sup> it is useful to identify any major imbalances in key demographics across our data and the sampling frame. We have some auxiliary information from which we can screen for imbalances. More specifically, we were able to obtain aggregate information on the age, race (percent white), religion (percent Christian), and marital status at the time of donation (percent married) for individuals contacted as part of our study. Figure 1 provides a visual representation of how close our respondents are to the sampling frame for each of the available demographic indicators. As demonstrated in Fig. 1, the characteristics of our non-respondents conform closely to the distribution in the sampling frame. Our sample is a little higher than expected in the 25 to 29 age category and a bit lower in the 30 to 35 category. In general, the distributions are similar, which in turn improves our confidence that major imbalances are unlikely and thus mitigates the potential for non-response bias in this subsample (none of the observed differences are statistically different from zero).

From a policy perspective, it is also worth noting that the active donors are probably the more important pool to measure. If the US regime changes from permitting to prohibiting anonymous sperm donation, active rather than inactive donors will likely be the first population from which sperm banks will try to recruit. However, given the relatively small sample size for active, anonymous donors ( $n = 52$ ), we focus on both active and inactive donors in the analysis that follows. Although this may be viewed as a limitation of our design, it is important to note that this was an extremely difficult—and expensive—sample to attain and it improves on existing experimental studies of policy change and donor compensation.

<sup>43</sup> Report of the NOAA Panel, *supra* note 41, at 4611.

<sup>44</sup> Cohen and Coan, *supra* note 5, at 726.

<sup>45</sup> See generally Robert M. Groves, *Nonresponse Rates and Nonresponse Bias in Household Surveys*, 70 PUB. OP. Q. 646 (2006).

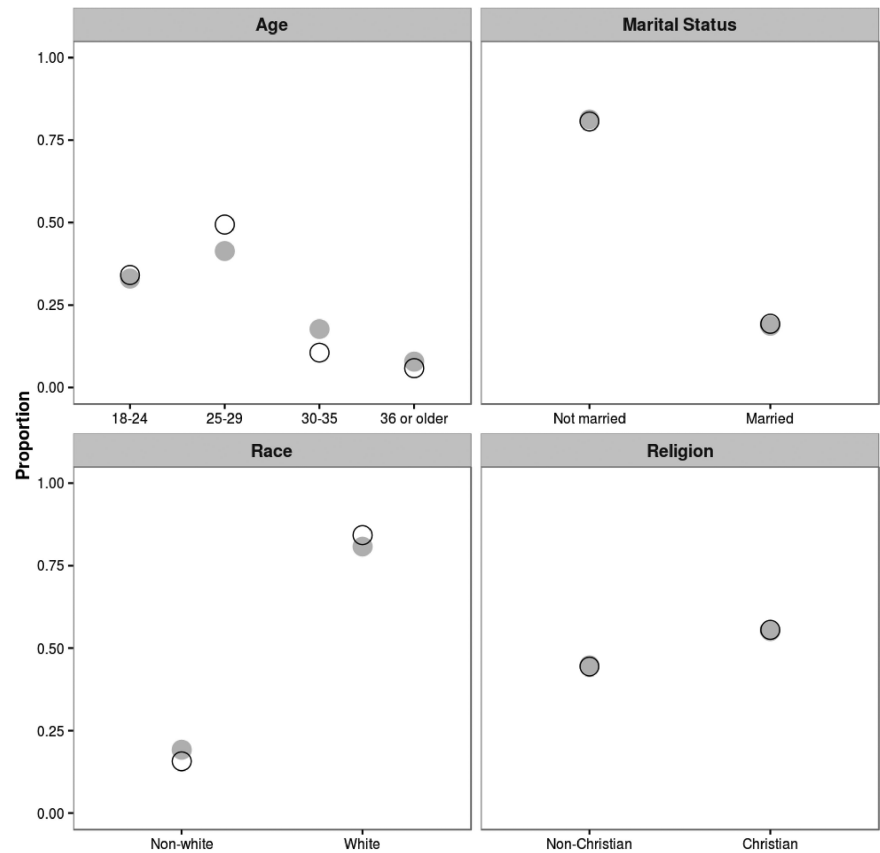


Figure 1. Assessing non-response among inactive donors. The gray ‘filled’ points represent the statistic of interest in the sampling frame, while ‘hollow’ points provide the same information for our inactive donor sample. Note that none of the observed differences are statistically different from zero.

E. Estimation procedure

To gauge donor reactions to the mandatory identification *treatment*, we focus on two primary outcomes measures: (i) whether the subject ‘refuses to donate at any price’ and (ii) the WTA for subjects remaining in the donor pool. These two measures allow one to effectively capture key points in a donor’s decision calculus. That is, when faced with a mandatory identification law, donors must first choose whether to remain in the market and then—conditional on their decision to continue donating—specify the financial incentive necessary to participate.

We model the first stage in this decision process using logistic regression and the second stage using the parametric WTA model outlined in Cohen and Coan (2013).<sup>46</sup>

<sup>46</sup> Decisions regarding the overall WTA are nested within the group of individuals that actually choose to remain in the donor pool. We begin our analysis by modeling the probability of *refusal* ( $r_i$ ) as a function of *treatment* assignment ( $T_i$ ) using a standard logistic regression model:

$$\Pr(r_i = 1) = \text{logit}^{-1}(\alpha_0 + \alpha_1 T_i)$$

While the details of logistic regression are well known to scholars of law and public policy, the analysis of contingent valuation data is less common. To remain consistent with past scholarship,<sup>47</sup> we utilize the standard exponential WTA function:

$$WTA_i = e^{\beta_0 + \beta T_i + \varepsilon_i},$$

where  $T_i$  represents an indicator variable for treatment status and  $\varepsilon_i$  is the stochastic error term ( $\ln(\varepsilon_i) \sim N(0, \sigma^2)$ ). Cohen and Coan<sup>48</sup> demonstrate that the commonly employed exponential WTA function was appropriate when valuing sperm donation both in pre-test data and in a convenience sample of potential donors. And given that the current study employs an experimental design very similar to the approach used in Cohen and Coan, we are confident regarding the usefulness of this specification in the current context.

There are also a number of challenges specific to modeling WTA data. Although relying on an open-ended question offers benefits in terms of efficiency, this elicitation format is susceptible to so-called protest bids.<sup>49</sup> Our sample is not immune to this problem: five subjects report a WTA of more than \$500 *per donation*, with a maximum bid of \$5000. Not adjusting for these extreme cases—especially given current sample sizes—has the potential to heavily influence reported differences across groups and yet there is no agreed upon method for treating these bids in the literature.<sup>50</sup> We are thus left with the question of how best to adjust for the potential influences of extreme bids.

Determining the ‘correct’ adjustment for protest bids turns on what one is willing to assume about the motivation of such bids and thus it is often necessary to estimate a range of models and gauge the sensitivity of the estimated WTA under varying

---

The next step is to model each subject’s WTA, conditional on their *refusal* or *non-refusal*. Assuming an exponential WTA function, we are left with the following:

$$WTA_i = \begin{cases} \text{irrelevant} & \text{if } r_i = 1 \\ e^{\beta_0 + \beta_1 T_i + \varepsilon_i} & \text{if } r_i = 0 \end{cases}$$

We can thus estimate differences in the WTA across *treatment* and *control* conditions using a standard log-normal regression.

Ideally, one would want to estimate the two steps simultaneously, propagating the error from the first to second stage. There are well-known methods for achieving this objective in the context of longitudinal data, c.f. Maren K. Olsen & Joseph L. Schafer, *A Two-Part Random-Effects Model for Semicontinuous Longitudinal Data*, 96 J. AM. STAT. ASS’N 730–45 (2001), identification is problematic in the cross-sectional context, see Armando Teixeira-Pinto & Sharon-Lise T. Normand, *Correlated Bivariate Continuous and Binary Outcomes: Issues and Applications*, 28 STAT. MED. 1753–73 (2009). Moreover, the identification strategies outlined in Teixeira-Pinto and Normand require strong assumptions on the relationship between the outcome variable across each stage and it is difficult to determine the appropriateness of these assumptions in the context of the sperm donation process. Given these difficulties, we employ the common assumption of independence in the covariance across the two stages; however, it is important to note that this assumption may somewhat understate the uncertainty associated with our estimates. *Id.*

<sup>47</sup> Cohen and Coan, *supra* note 5.

<sup>48</sup> *Id.*

<sup>49</sup> See generally John M. Halstead, A.E. Luloff & Thomas H. Stevens, *Protest Bidders In Contingent Valuation*, 21 NE. J. AGRIC. & RES. ECON. 160 (1992).

<sup>50</sup> Greg Lindsey, *Market Models, Protest Bids, and Outliers in Contingent Valuation*, 120 J. WATER RES. MGMT. 121 (1994).



assumptions.<sup>51</sup> At one extreme, an analyst may include outlying bids during estimation, reasoning that donors have carefully considered the costs of donation under different regulatory environments and have registered accurate WTA values accordingly. At the other extreme, one may simply drop—or ‘trim’—extreme observations, assuming that for all practical purposes these bids are equivalent to ‘refus[ing] to donate at any price’. As a middle ground between these two extremes, one might also advocate treating extreme observations as *censored* and estimate models to accurately censoring in WTA data.

With little theoretical guidance as to which assumption is more appropriate in the context of past and present sperm donors, we estimate the WTA of donation under a range of different scenarios. Specifically, in the next section, we not only present estimates using the ‘full sample’ (ie including protest bids), but also estimates that censor extreme observations across a range of pre-specified values (\$500 and \$400).

## IV. RESULTS<sup>52</sup>

### A. Refusal to donate

We begin our analysis by examining whether and to what extent subjects receiving the treatment condition refuse to donate ‘for any amount of money’. Figure 2 provides the posterior distribution of the first difference in the predicted probability of respondents that ‘refuse to donate’ across the *treatment* and *control* conditions. First, when considering the full sample of both active and inactive donors (see Fig. 2a), our data suggest that moving to a mandatory donor identification system could lead to roughly 29 per cent of our participants refusing to donate (posterior median = 0.287, 95 per cent credible interval = [0.126, 0.436]). Second, when restricting the subsample of active donors (see Fig. 2b), we find that mandatory identification could lead approximately 28 per cent of participants to refuse to donate (posterior mean = 0.282, 95 per cent credible interval = [0.069, 0.485]). An estimated decline in the number of participants close to 30 per cent would arguably have economic implications for the market for sperm donation—both in terms of the potential costs of maintaining an adequate level of donor supply and/or the quality of the samples provided.<sup>53</sup> The estimated credible intervals are quite wide. Yet, even assuming a lower-bound estimate of an approximate 7 per cent refusal rate, the potential economic implications of a change in identification laws remains considerable.

<sup>51</sup> *Id.*

<sup>52</sup> We use Bayesian methods to estimate the models described in Section III.E (though the results are consistent when using classical methods). Across all specifications, we follow Gelman et al.’s suggestion and use weakly informative priors. For the logistic regression parameters ( $\alpha_0$  and  $\alpha_1$ ), we use Cauchy priors ( $\alpha \sim \text{Cauchy}(0, 2.5)$ ); for log-normal regression, we rely on normal priors after standardizing the (log) WTA ( $\beta \sim N(0, 1)$ ); and for the standard deviation for the log-normal regression, we rely on a half-Cauchy prior ( $\sigma \sim \text{half-Cauchy}(0, 5)$ ). See generally Andrew Gelman et al., *A Weakly Informative Default Prior Distribution for Logistic and other Regression Models*, 2 ANN. APPL. STAT. 1360 (2008). Note that all of the data and code necessary to replicate this analysis are available at [https://github.com/traviscoan/donor\\_compensation](https://github.com/traviscoan/donor_compensation) (accessed Oct. 12, 2016).

<sup>53</sup> Though, as we discuss in greater depth below, there are normative controversies about how to define ‘quality’, and whether in some domains sperm banks are too selective.

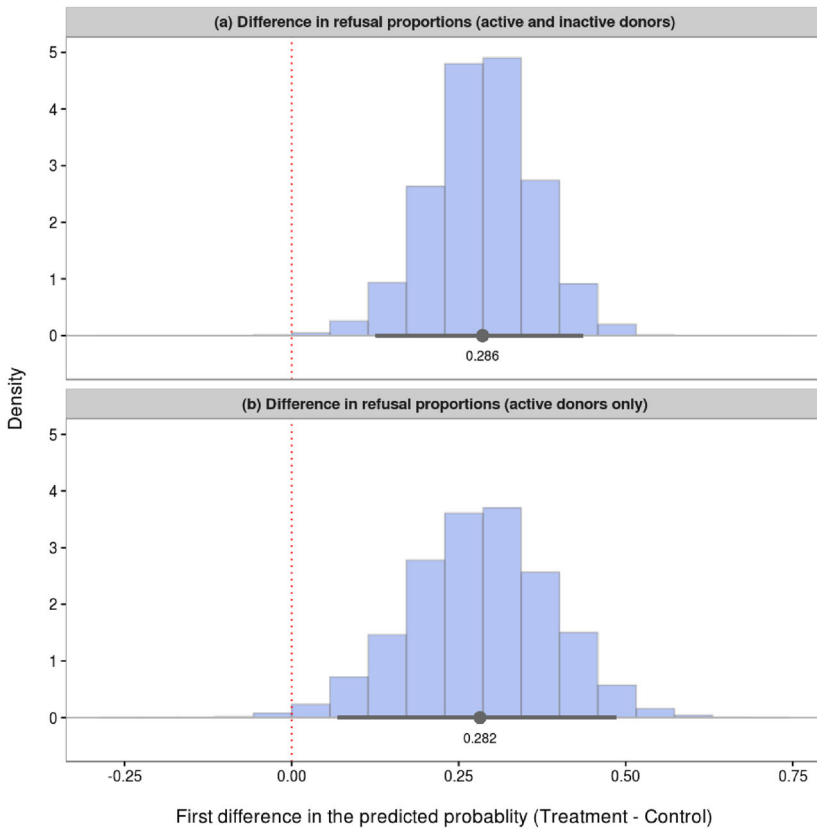


Figure 2. The effect of mandatory identification on refusal to donate. The estimates are based on the differences in the predicted probability of ‘refusal’ across the treatment and control conditions from a logistic regression. Each subfigure provides the full posterior distribution ( $n = 5000$  draws), the posterior median (gray dot), and the 95 per cent highest density interval (gray line).

### B. Estimated changes in the WTA to donate

The previous section suggests that mandatory identification could lead to roughly 28 per cent of respondents refusing to donate ‘at any price’. When considering those individuals that would still consider donating, the obvious question remains: What price is needed to ensure continued participation? Figure 3 provides the estimated effect of receiving the *treatment* under a range of different assumptions.<sup>54</sup> Starting with our estimates based on the ‘full sample’ (ie both extreme and non-extreme bids), these data suggest a difference in the median WTA across treatment and control of approximately \$102 (posterior median = \$102.076, 95 per cent highest density interval = [\$46.497, \$171.819]). In economic terms, this difference is considerable: individuals

<sup>54</sup> Note that Figure 3 pools both active and inactive donors due to the relatively small sample size available after adjusting for subjects that refuse to donate at any price ( $n = 71$ , including both active and inactive). While this is less than ideal from a policy perspective (see the discussion in Section III.D), it is necessary to ensure adequate precision for our estimates.

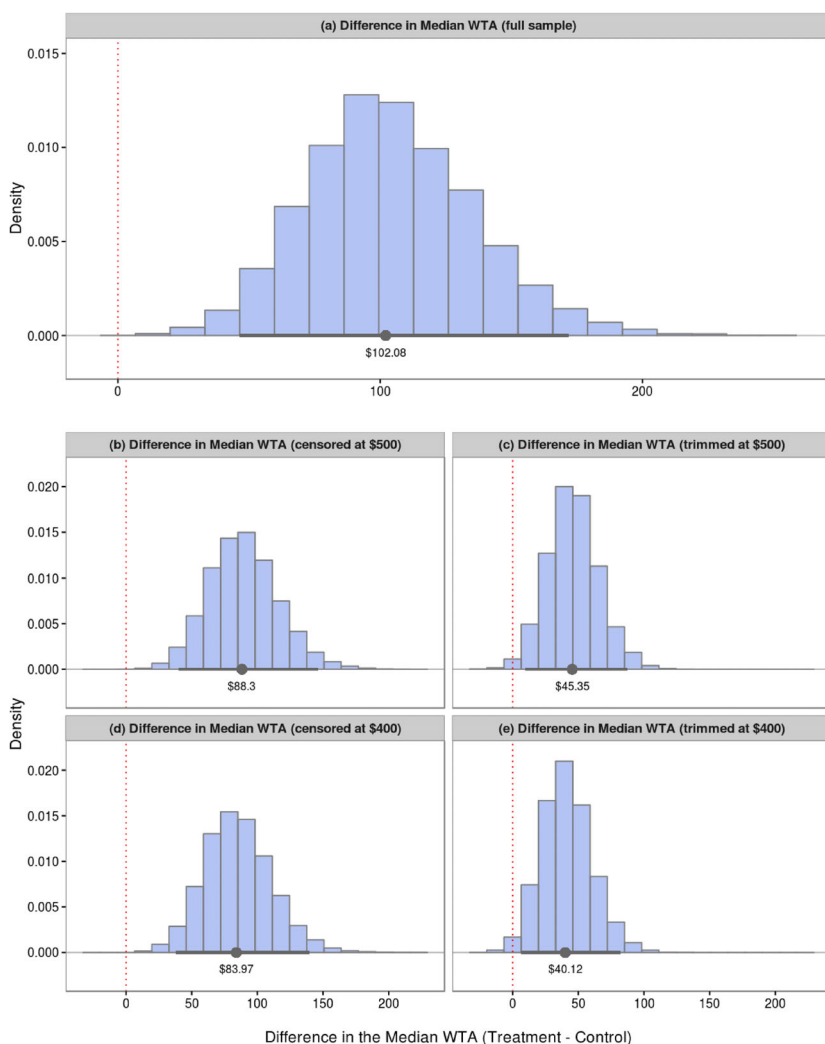


Figure 3. The effect of mandatory identification on WTA. The estimates assume an exponential WTA function and are based on a log-normal regression. Each subfigure provides the full posterior distribution ( $n = 5000$  draws), the posterior mode (gray dot), and the 95 per cent highest density interval. Note that the left column provides estimates when ‘censoring’ and the right column presents the same estimates when ‘trimming’ the WTA distribution at a given cut point (eg simply dropping all observations greater than a particular value).

receiving the mandatory donor identification treatment demanded more than double the current rate compensation.

Including protest bids in the WTA estimate may overstate the effect of mandatory identification laws on the necessary level of donor compensation. How sensitive is this estimate to alternative assumptions on extreme bids? To explore this question, we present estimates under a range of assumptions regarding extreme observations.

Turning first to the censored estimates (Fig. 3b and d), we find that the difference between treatment and control is considerable, even when assuming a relatively conservative cut-off point for what constitutes a ‘protest bid’. Specifically, when censoring the WTA values at \$400 per donation (about five times the current going rate), the estimated median difference is approximately \$84 (posterior median = \$83.974, 95 per cent highest density interval = [\$38.286, \$139.745]). In contrast to the estimates based on censored models, the ‘trimmed’ specifications are more influenced by one’s decision regarding what constitutes a protest bid. In the conservative scenario with an assumed cut-off point of \$400, the estimated median difference is \$40 (posterior median = \$40.12, 95 per cent highest density interval = [\$6.434, \$82.082]). While about half of the censored regression estimate under similar assumptions, this effect still represents economically meaningful change in the price of sperm.

## V. DISCUSSION

Our study is the first to examine how current US sperm donors would react to legal change requiring identification of those donors through a registry system of the kind in place in the United Kingdom, the most plausible policy alternative. We find that such a change would have significant effects. Our best estimate is that 28 per cent of current sperm donors will refuse to donate if the law changed in this way, and the remaining donors would demand anywhere from \$40 to \$102 more per donation in our preferred specification, depending on how one defines a protest bid.<sup>55</sup>

Are these numbers large or small?

Our results generally suggest that changes in mandatory identification rules have a considerable impact on an individual’s preference regarding donation.

First, in terms of the willingness to donate *at all* under a regime that required identification, Cohen and Coan found that not a single individual from the general public refused to donate when exposed to the mandatory identification treatment condition.<sup>56</sup> By contrast, we find here that over a quarter of active, anonymous donors would refuse to donate ‘at any price’ if identification was legally required. All else equal, this reaction would imply a considerable drop in the current number of available donors. It is possible the effect is even larger because our design determines whether active donors would donate or not with a change in the law, but does not determine whether those active donors willing to donate might reduce the amount of donation should the law change—though to be fair the opposite reaction is possible, if less plausible.

Second, in terms of the extra amount required to pay sperm donors per donation, Cohen and Coan found that roughly \$31 per sperm donation was required to induce individuals to be identified rather than anonymous donors.<sup>57</sup> We find here that depending on the estimate used, it would require anywhere from roughly a 29 per cent increase to three times that amount for actual sperm donors.

<sup>55</sup> It is important to note that choosing a cut-off point for protest bids could influence the estimated refusal proportion. If one relies on the trimmed estimates—and thus assumes that protest bids and refusal to donate are equivalent—then the refusal proportions in Figure 2 will rise (or fall) based on the assumed cut-off point. For instance, if one assumes a (conservative) cut-off of \$400, this estimated refusal probability from 0.28 to 0.39 for active donors (posterior median = 0.389, 95 per cent highest density interval = [0.169, 0.588]).

<sup>56</sup> Cohen and Coan, *supra* note 5, at 734.

<sup>57</sup> *Id.*

When considering the actual cost increase associated with mandatory identification laws, it is *market*, not individual, reactions that are paramount. How will the market for sperm donors react to such a change in law? Answering this question involves having information on the shape of the demand and supply curves for donations, while also considering the potential implications for the 'quality' of the donor pool. Unfortunately, detailed information identifying supply and demand are not publicly available—yet, we can still assess the plausibility of a range of scenarios under alternative assumptions.

We first outline a scenario in which changes in the law have little influence on price. If we assume that demand is relatively inelastic (unresponsive to price) and the pool of potential donors is much larger than current demand, then a change in the law should have a nominal impact on the actual price. For instance, if the market offers an additional \$85 per donation, this could spur more young men to enter the donor pool, while also enticing current donors to donate more frequently. Moreover, given that each donation can be spread over multiple vials, the actual increase in production cost passed on to consumers may be quite modest. As such, market forces work to mitigate the potential impacts of 28 per cent drop in the current donor pool and anywhere from \$40 to \$102 increase required per donation.

There are, however, a number of features associated with the US market that challenge this optimism. While the US market is currently experiencing an excess supply of donors and inventory, these excesses vary considerably across racial and ethnic groups. For sought after donor profiles, the market is often quite thin and thus a double-digit decline in the current donor pool could prove significant. Moreover, the vast majority of American males have not considered donating and of the ones that do, only roughly 1/200 applicants makes it through the rigorous screening process. These observations raise important questions regarding the assumption of a 'thick' labor market for donations and suggest important trade-offs regarding the 'quality' of the donor pool given current consumer preferences.

In the end, considerable uncertainty remains regarding the likely market reaction to mandatory donor identification rules and what this means for price. Further, the expected effect of donor laws turns on what one is willing to assume regarding the size of the potential pool of donors and how sensitive individuals not in the current donor pool are to price. Yet, it is important to note that even a pessimistic view on a potential increase in the price of sperm would nonetheless still imply a cost well below the current price paid for donor eggs. Egg donors are paid roughly \$5000 to \$10 000 typically per cycle in the USA, although the risks and burdens of egg donation are significantly higher.<sup>58</sup>

How should this study and Cohen and Coan be read together?

Actual sperm donors seem to be a more ecologically valid sample from which to draw these estimates. Therefore, we believe that the 28 per cent refusal rate and between \$40 and \$102 per sperm donation are better estimates for *actual* sperm donors. We can offer two hypotheses for why these numbers differ from Cohen and Coan, each of which has different implications for policy:

First, current sperm donors are more subject to endowment effects regarding the current state of the law, and their responses may reflect a feeling of 'loss' of something

<sup>58</sup> See *supra* note 35.

they value (anonymity) that will not be available to future donors should the law change. For this reason it is possible that our results represent a transitional effect, such that new populations of sperm donors might be more willing to participate in an identification-required regime and demand less payment closer to that in Cohen and Coan.

Second, current sperm donors are ‘elite’ in the sense that the vast majority of sperm banks are notoriously selective in who they permit to donate, including screening many individuals based on family medical history and how well their sperm freezes. Indeed, upward of 90 per cent of individuals who make initial contact with a sperm bank in the USA are not chosen to become sperm donors.<sup>59</sup> In order to maintain the current number of sperm donors, banks thus might need to relax some of their standards, which would bring the sperm donor population more in line with the estimates in Cohen and Coan.<sup>60</sup> Whether such a change in standards would be good or bad depends, in part, on how much of the current standards reflect success rates and health requirements as opposed to the preferences of the recipients of the sperm. That said, there are likely elements of the existing standards whose importance is beyond cavil—lack of STI or other serious genetic diseases and the ability for sperm to freeze well and thus produce successful offspring when thawed. There may also be opportunities in targeting different kinds of men for recruitment as sperm donors in a way that maintains more of the current standards; for example, in Sweden and the Australian province of Victoria, ‘recruitment efforts have focused increasingly on the older, more altruistically motivated donor as a way of rebounding from the initial dampening effects’ of the prohibition on donor anonymity.<sup>61</sup>

A different way of contextualizing our results is by comparison to international experience. To lose roughly a third of one’s donor is no doubt a significant problem for most sperm banks. But certainly the effect would be smaller than that reported in the observational studies in the literature in Sweden. In the three years after its law changed, Sweden saw the number of new donors per year decline from 200 to 30 (though these are *new* donors).<sup>62</sup> As discussed above, there are ongoing arguments about whether these numbers rebounded (suggesting the transitional problem discussed above) or have remained low, and there have been similar debates over data from other countries that have adopted prohibitions on sperm donor anonymity.

## VI. CONCLUSION

Much of the world has moved to prohibiting sperm donor anonymity. In the midst of an ongoing bioethics debate, there are those who advocate that the USA adopt a model of

<sup>59</sup> ALMELING, *supra* note 36, at 59.

<sup>60</sup> Cohen and Coan, *supra* note 5.

<sup>61</sup> Ellen Waldman, *What Do We Tell the Children?*, 35 CAP. U. L. REV. 517, 552–53 (2006). One of the reviewers for this article raised the question of whether there were important differences between active and ‘retired’ donors in our sample. When we asked our sperm bank contact we were told: ‘Retired donors did not have an experience significantly different than actively producing donors. The compensation has not changed much if at all in the past decade. The amount of information collected from them has also not changed. The basic screening protocols are similar across banks due to FDA regulations that determine donor eligibility that went into effect 5/25/2005’.

<sup>62</sup> Bernstein, *supra* note 16, at 1207–08; Bygedemen, *supra* note 19, at 266; Daniels and Lalos, *supra* note 19, at 1871–72.



registering sperm donors and making their identities available to offspring at age 18, the model the United Kingdom adopted. One major concern is that such a change would result in shortages of sperm donors. This study is the first to examine how existing sperm donors would react to such a change. We find that in our preferred specifications 28 per cent of sperm donors at a large US sperm bank would refuse to participate if anonymity is prohibited. Among those who would continue to participate, the typical donor would demand a premium of anywhere from \$40 to \$102 over what they are currently paid. Our findings suggest that such a change would have a significant, but perhaps not insurmountable, effect on the supply of sperm in the USA should the law change.

We hope that this study creates a foundation for other research in this area. A few particular projects would be interesting to pursue: first, our work here and the prior work of Cohen and Coan have focused only on *sperm* donors. Across the world the law changes have affected not only men but also women who serve as *egg* donors. It would be useful to understand whether egg donors have similar or different reactions to law changes prohibiting donor anonymity. Second, this study examines sperm donors' reactions to only one method of disclosure, based on the registry system in place in the United Kingdom and a number of other countries where the child may call in at age 18 to determine if he or she is donor conceived and receive identifying information about the donor. While this has been the main disclosure regime put into place across the world, one can imagine other possible approaches including providing the information directly to children at age 18 regardless of whether they call in to find out, giving donors the right to contact the children, maintaining the UK-type registry but making the information on the donor available to children at a younger age, and so forth. It would be interesting in further work to examine sperm donors' reactions to this richer panoply of possible market designs. A final suggestion for further research came from one of the paper's reviewers who suggested that we might also repeat our study with sperm donor *applicants*, rather than those who had been *accepted* as sperm donors.

#### ACKNOWLEDGEMENTS

The authors thank Rene Almeling, Jim Greiner, and Holger Spamann for helpful comments on earlier drafts. They also thank Russell Spivak for excellent research assistance. Dr. Coan was supported by an Economic and Social Research Council 'Methodological Innovations' grant ( ES/N012283/1), and an Economic and Social Research Council 'Media in context' grant ( ES/M010775/1).